

AMENDMENTS TO THE SPECIFICATION

Please amend the specification as follows:

Please replace the paragraph beginning page 3, line 1, with the following rewritten paragraph:

The invention as described in a first aspect~~claim 1~~ is a rewritable optical disc with a spiral or concentric track comprising:

Please replace the paragraph beginning page 3, line 18, with the following rewritten paragraph:

The invention as described in a second aspect~~claim 2~~ is an optical disc as described in the first aspect~~claim 1~~, wherein the first, second, and third groove discontinuities have a mirror surface.

Please replace the paragraph beginning page 3, line 21, with the following rewritten paragraph:

The invention as described in a third aspect~~claim 3~~ is an optical disc as described in the first aspect~~claim 1~~, wherein the first, second, and third groove discontinuities are formed in maximum amplitude parts of the wobble groove.

Please replace the paragraph beginning page 3, line 24, with the following rewritten paragraph:

The invention as described in a fourth aspect~~claim 4~~ is an optical disc as described in the first aspect~~claim 1~~, wherein the first, second, and third groove discontinuities are formed in the minimum amplitude part of the wobble groove.

Please replace the paragraph beginning page 3, line 27, with the following rewritten paragraph:

The invention as described in a fifth aspect~~claim 5~~ is an optical disc as described in the first aspect~~claim 1~~, wherein the first, second, and third widths W1, W0, and Ws are all longer than the longest mark contained in data recorded to a groove and less than or equal to ½ wobble period.

Please replace the paragraph beginning page 4, line 3, with the following rewritten paragraph:

The invention as described in a sixth aspect~~claim 6~~ is an optical disc as described in the first aspect~~claim 1~~, wherein the first, second, and third widths W1, W0, and Ws are all longer than the longest mark contained in data recorded to a groove and less than or equal to 1/4 wobble period.

Please replace the paragraph beginning page 4, line 7, with the following rewritten paragraph:

The invention as described in a seventh aspect~~claim 7~~ is an optical disc as described in the first aspect~~claim 1~~, wherein the ratio between first, second, and third widths W1, W0, and Ws is 1:2:4 where any one of widths W1, W0, and Ws is 1.

Please replace the paragraph beginning page 4, line 10, with the following rewritten paragraph:

The invention as described in an eighth aspect~~claim 8~~ is an optical disc as described in the first aspect~~claim 1~~, wherein the ratio between first, second, and third widths W1, W0, and Ws is 2:1:4.

Please replace the paragraph beginning page 4, line 13, with the following rewritten paragraph:

The invention as described in a ninth aspect~~claim 9~~ is an optical disc as described in the first aspect~~claim 1~~, wherein the first, second, and third widths W1, W0, and Ws are two bytes, one byte, and four bytes, respectively.

Please replace the paragraph beginning page 4, line 16, with the following rewritten paragraph:

The invention as described in a tenth aspect~~claim 10~~ is a rewritable optical disc with a spiral or concentric track comprising:

Please replace the paragraph beginning page 5, line 4, with the following rewritten paragraph:

The invention as described in an eleventh aspect~~claim 11~~ is an optical disc as described in the tenth aspect~~claim 10~~, wherein:

Please replace the paragraph beginning page 5, line 10, with the following rewritten paragraph:

The invention as described in a twelfth aspect~~claim 12~~ is an optical disc as described in the tenth~~claim 10~~, wherein the groove bottom offset portions and groove top offset portions are disposed at maximum amplitude parts of the wobble groove and are offset in a track center direction.

Please replace the paragraph beginning page 5, line 14, with the following rewritten paragraph:

The invention as described in a thirteenth aspect~~claim 13~~ is an optical disc as described in the tenth aspect~~claim 10~~, wherein groove bottom offset portions and groove top offset portions of a synchronization mark are mutually adjacent at $n+(\frac{1}{2})$ wobble cycles (where n is a positive integer).

Please replace the paragraph beginning page 5, line 18, with the following rewritten paragraph:

The invention as described in a fourteenth aspect~~claim 14~~ is an optical disc as described in the thirteenth aspect~~claim 13~~, wherein n is 0.

Please replace the paragraph beginning page 5, line 20, with the following rewritten paragraph:

The invention as described in a fifteenth aspect~~claim 15~~ is a rewritable optical disc with a spiral or concentric track comprising:

Please replace the paragraph beginning page 6, line 10, with the following rewritten paragraph:

The invention as described in a sixteenth aspect~~claim 16~~ is an optical disc as described in the fifteenth aspect~~claim 15~~, wherein a positive mark is formed by a groove ascending-phase inversion part, a negative mark is formed by a groove descending-phase inversion part, and a synchronization mark is formed by a combination of a groove descending-phase inversion part and groove ascending-phase inversion part.

Please replace the paragraph beginning page 6, line 16, with the following rewritten paragraph:

The invention as described in a seventeenth aspect~~claim 17~~ is an optical disc as described in the fifteenth aspect~~claim 15~~, wherein both ends of said groove descending-phase inversion parts and groove ascending-phase inversion parts are a groove discontinuity.

Please replace the paragraph beginning page 6, line 20, with the following rewritten paragraph:

The invention as described in an eighteenth aspect~~claim 18~~ is an optical disc as described in the fifteenth aspect~~claim 15~~, wherein both ends of said groove descending-phase inversion parts and groove ascending-phase inversion parts are an abruptly displaced groove.

Please replace the paragraph beginning page 6, line 24, with the following rewritten paragraph:

The invention as described in a nineteenth aspect~~claim 19~~ is a rewritable optical disc with a spiral or concentric track comprising:

Please replace the paragraph beginning page 7, line 20, with the following rewritten paragraph:

The invention as described in a twentieth aspect~~claim 20~~ is an optical disc as described in the nineteenth aspect~~claim 19~~, wherein a positive mark is formed by a groove ascending-rectilinear portion, a negative mark is formed by a groove descending-rectilinear portion, and a synchronization mark is formed by a combination of a groove descending-rectilinear portion and groove ascending-rectilinear portion.

Please replace the paragraph beginning page 7, line 26, with the following rewritten paragraph:

The invention as described in a twenty-first aspect~~claim 21~~ is an optical disc as described in the nineteenth aspect~~claim 19~~, wherein each positive mark, negative mark, and synchronization mark

is formed by said groove ascending-rectilinear portion being repeated for a plurality of cycles of the wobbled groove, said groove descending-rectilinear portion being repeated for a plurality of cycles of the wobbled groove, or said combination of a groove descending-rectilinear portion and groove ascending-rectilinear portion being repeated for a plurality of cycles of the wobbled groove.

Please replace the paragraph beginning page 8, line 6, with the following rewritten paragraph:

The invention as described in a twenty-second aspect~~claim 22~~ is an optical disc as described in the twenty-first aspect~~claim 21~~, wherein each positive mark is formed by said groove ascending-rectilinear portion being repeated for a plurality of cycles of the wobbled groove,

Please replace the paragraph beginning page 8, line 16, with the following rewritten paragraph:

The invention as described in a twenty-third aspect~~claim 23~~ is an address reading apparatus for detecting synchronization marks, positive marks, and negative marks contained in an optical disc as described in the first aspect~~claim 1~~ and accumulating 1 and 0 data obtained from positive marks and negative marks dispersedly contained in one sector block to read said sector block address, comprising:

Please replace the paragraph beginning page 8, line 21, with the following rewritten paragraph:

an optical head~~(2)~~ for emitting a laser beam to a track of the optical disc and detecting reflected light by means of two photodetectors separated along the track direction;

Please replace the paragraph beginning page 8, line 24, with the following rewritten paragraph:

a subtracter~~(4)~~ for getting a difference of signals from the two photodetectors and generating a difference signal;

Please replace the paragraph beginning page 8, line 26, with the following rewritten paragraph:

a filter (6) for removing a wobble frequency component of a wobbled track and generating a groove discontinuity pulse;

Please replace the paragraph beginning page 9, line 1, with the following rewritten paragraph:

a discriminator (12) for detecting a groove discontinuity pulse width and discriminating each synchronization mark, positive mark, and negative mark based on said width to generate a synchronization mark signal, positive mark signal, and negative mark signal; and

Please replace the paragraph beginning page 9, line 5, with the following rewritten paragraph:

a demodulator (14) for generating 1s and 0s according to each positive mark signal and negative mark signal contained between one synchronization mark signal and a next synchronization mark signal.

Please replace the paragraph beginning page 9, line 8, with the following rewritten paragraph:

The invention as described in a twenty-fourth aspect~~claim 24~~ is an address reading method for detecting synchronization marks, positive marks, and negative marks contained in an optical disc as described in the first aspect~~claim 1~~ and accumulating 1 and 0 data obtained from positive marks and negative marks dispersedly contained in one sector block to read said sector block address, comprising:

Please replace the paragraph beginning page 9, line 27, with the following rewritten paragraph:

The invention as described in a twenty-fifth aspect~~claim 25~~ is an address reading apparatus for detecting synchronization marks, positive marks, and negative marks contained in an optical disc as described in the tenth aspect~~claim 10~~ and accumulating 1 and 0 data obtained from positive marks and negative marks dispersedly contained in one sector block to read said sector block address, comprising:

Please replace the paragraph beginning page 10, line 4, with the following rewritten paragraph:

an optical head~~(2)~~ for emitting a laser beam to a track of the optical disc and detecting reflected light by means of two photodetectors separated along the track direction;

Please replace the paragraph beginning page 10, line 7, with the following rewritten paragraph:

a subtracter~~(4)~~ for getting a difference of signals from the two photodetectors and generating a difference signal;

Please replace the paragraph beginning page 10, line 9, with the following rewritten paragraph:

a filter~~(6)~~ for removing a wobble frequency component of a wobbled track and generating a groove bottom offset portion pulse in a negative direction and a groove top offset portion pulse in a positive direction;

Please replace the paragraph beginning page 10, line 12, with the following rewritten paragraph:

discriminators~~(52, 54, 12)~~ for discriminating each synchronization mark, positive mark, and negative mark based on said groove top offset portion pulse, groove bottom offset portion pulse, and groove bottom offset portion pulse and groove top offset portion pulse pair to generate a positive mark signal, negative mark signal, and synchronization mark signal; and

Please replace the paragraph beginning page 10, line 18, with the following rewritten paragraph:

a demodulator~~(14)~~ for generating 1s and 0s according to each positive mark signal and negative mark signal contained between one synchronization mark signal and a next synchronization mark signal.

Please replace the paragraph beginning page 10, line 21, with the following rewritten paragraph:

The invention as described in a twenty-sixth aspect~~claim 26~~ is an address reading method for detecting synchronization marks, positive marks, and negative marks contained in an optical disc as described in the tenth aspect~~claim 10~~ and accumulating 1 and 0 data obtained from positive marks and negative marks dispersedly contained in one sector block to read said sector block address, comprising:

Please replace the paragraph beginning page 11, line 14, with the following rewritten paragraph:

The invention as described in a twenty-seventh aspect~~claim 27~~ is an address reading apparatus for detecting synchronization marks, positive marks, and negative marks contained in an optical disc as described in the fifteenth aspect~~claim 15~~ and accumulating 1 and 0 data obtained from positive marks and negative marks dispersedly contained in one sector block to read said sector block address, comprising:

Please replace the paragraph beginning page 11, line 19, with the following rewritten paragraph:

an optical head~~(2)~~ for emitting a laser beam to a track of the optical disc and detecting reflected light by means of two photodetectors separated along the track direction;

Please replace the paragraph beginning page 11, line 22, with the following rewritten paragraph:

a subtracter~~(4)~~ for getting a difference of signals from the two photodetectors and generating a difference signal;

Please replace the paragraph beginning page 11, line 24, with the following rewritten paragraph:

a filter (6) for removing a wobble frequency component of a wobbled track and generating a groove descending-phase inversion part pulse in a negative direction and a groove ascending-phase inversion part pulse in a positive direction;

Please replace the paragraph beginning page 12, line 1, with the following rewritten paragraph:

discriminators (52, 54, 12) for discriminating each synchronization mark, positive mark, and negative mark based on said groove ascending-phase inversion part pulse, groove descending-phase inversion part pulse, and groove descending-phase inversion part pulse and groove ascending-phase inversion part pulse pair to generate a positive mark signal, negative mark signal, and synchronization mark signal; and

Please replace the paragraph beginning page 12, line 7, with the following rewritten paragraph:

a demodulator (14) for generating 1s and 0s according to each positive mark signal and negative mark signal contained between one synchronization mark signal and a next synchronization mark signal.

Please replace the paragraph beginning page 12, line 10, with the following rewritten paragraph:

The invention as described in a twenty-eighth aspect~~claim 28~~ is an address reading method for detecting synchronization marks, positive marks, and negative marks contained in an optical disc as described in the fifteenth aspect~~claim 15~~ and accumulating 1 and 0 data obtained from positive marks and negative marks dispersedly contained in one sector block to read said sector block address, comprising:

Please replace the paragraph beginning page 13, line 6, with the following rewritten paragraph:

The invention as described in a twenty-ninth aspect~~claim 29~~ is an address reading apparatus for detecting synchronization marks, positive marks, and negative marks contained in an optical disc as described in the nineteenth aspect~~claim 19~~ and accumulating 1 and 0 data obtained from positive marks and negative marks dispersedly contained in one sector block to read said sector block address, comprising:

Please replace the paragraph beginning page 13, line 11, with the following rewritten paragraph:

an optical head~~(2)~~ for emitting a laser beam to a track of the optical disc and detecting reflected light by means of two photodetectors separated along the track direction;

Please replace the paragraph beginning page 13, line 14, with the following rewritten paragraph:

a subtracter~~(4)~~ for getting a difference of signals from the two photodetectors and generating a difference signal;

Please replace the paragraph beginning page 13, line 16, with the following rewritten paragraph:

a filter~~(6)~~ for removing a wobble frequency component of a wobbled track and generating a groove descending-rectilinear portion pulse in a negative direction and a groove ascending-rectilinear portion pulse in a positive direction;

Please replace the paragraph beginning page 13, line 20, with the following rewritten paragraph:

discriminators~~(52, 54, 12)~~ for discriminating each synchronization mark, positive mark, and negative mark based on said groove ascending-rectilinear portion pulse, groove descending-rectilinear portion pulse, and groove descending-rectilinear portion pulse and groove

ascending-rectilinear portion pulse pair to generate a positive mark signal, negative mark signal, and synchronization mark signal; and

Please replace the paragraph beginning page 13, line 26, with the following rewritten paragraph:

a demodulator-(14) for generating 1s and 0s according to each positive mark signal and negative mark signal contained between one synchronization mark signal and a next synchronization mark signal.

Please replace the paragraph beginning page 14, line 1, with the following rewritten paragraph:

The invention as described in a thirtieth aspectclaim-30 is an address reading method for detecting synchronization marks, positive marks, and negative marks contained in an optical disc as described in the nineteenth aspectclaim-19 and accumulating 1 and 0 data obtained from positive marks and negative marks dispersedly contained in one sector block to read said sector block address, comprising:

Please replace the paragraph beginning page 14, line 23, with the following rewritten paragraph:

The invention as described in a thirty-first aspectclaim-31 is an address reading apparatus for detecting synchronization marks, positive marks, and negative marks contained in an optical disc as described in the twenty-first aspectclaim-21 and accumulating 1 and 0 data obtained from positive marks and negative marks dispersedly contained in one sector block to read said sector block address, comprising:

Please replace the paragraph beginning page 15, line 1, with the following rewritten paragraph:

an optical head-(2) for emitting a laser beam to a track of the optical disc and detecting reflected light by means of two photodetectors separated along the track direction;

Please replace the paragraph beginning page 15, line 4, with the following rewritten paragraph:

a subtracter~~(4)~~ for getting a difference of signals from the two photodetectors and generating a difference signal;

Please replace the paragraph beginning page 15, line 6, with the following rewritten paragraph:

a filter~~(6)~~ for removing a wobble frequency component of a wobbled track and generating a groove descending-rectilinear portion pulse in a negative direction and a groove ascending-rectilinear portion pulse in a positive direction;

Please replace the paragraph beginning page 15, line 10, with the following rewritten paragraph:

a first counter~~(93)~~ for counting a number of groove descending-rectilinear portion pulses in a negative direction contained in one sector;

Please replace the paragraph beginning page 15, line 12, with the following rewritten paragraph:

a second counter~~(94)~~ for counting a number of groove ascending-rectilinear portion pulses in a positive direction contained in one sector;

Please replace the paragraph beginning page 15, line 15, with the following rewritten paragraph:

discriminators~~(95 to 99)~~ for comparing a first count from the first counter and a second count from the second counter and discriminating each synchronization mark, positive mark, and negative mark according to whether the first count is sufficiently high, the second count is sufficiently high, or the first count and second count are substantially equal to generate a positive mark signal, negative mark signal, and synchronization mark signal; and

Please replace the paragraph beginning page 15, line 21, with the following rewritten paragraph:

a demodulator (~~14~~) for generating 1s and 0s according to each positive mark signal and negative mark signal contained between one synchronization mark signal and a next synchronization mark signal.

Please replace the paragraph beginning page 15, line 24, with the following rewritten paragraph:

The invention as described in a thirty-second aspect~~claim 32~~ is an address reading method for detecting synchronization marks, positive marks, and negative marks contained in an optical disc as described in the twenty-first aspect~~claim 21~~ and accumulating 1 and 0 data obtained from positive marks and negative marks dispersedly contained in one sector block to read said sector block address, comprising:

Please replace the paragraph beginning page 16, line 22, with the following rewritten paragraph:

The invention as described in a thirty-third aspect~~claim 33~~ is an optical disc as described in the nineteenth aspect~~claim 19~~, wherein the synchronization mark further has a block mark indicating a sector block starting position.

Please replace the paragraph beginning page 16, line 25, with the following rewritten paragraph:

The invention as described in a thirty-fourth aspect~~claim 34~~ is an optical disc as described in the thirty-third aspect~~claim 33~~, wherein said block mark is formed by disposing a discontinuity in the track groove.

Please replace the paragraph beginning page 17, line 1, with the following rewritten paragraph:

The invention as described in a thirty-fifth aspect~~claim 35~~ is an optical disc as described in the thirty-third aspect~~claim 33~~, wherein said block mark is formed by locally changing a width of the track groove.

Please replace the paragraph beginning page 17, line 4, with the following rewritten paragraph:

The invention as described in a thirty-sixth aspect~~claim 36~~ is an optical disc as described in the thirty-third aspect~~claim 33~~, wherein said block mark is formed by locally changing wobble amplitude.

Please replace the paragraph beginning page 17, line 7, with the following rewritten paragraph:

The invention as described in a thirty-seventh aspect~~claim 37~~ is an optical disc as described in the nineteenth aspect~~claim 19~~, wherein each wobble cycle is formed so that the duty ratio differs according to positive data and negative data.

Please replace the paragraph beginning page 17, line 10, with the following rewritten paragraph:

The invention as described in a thirty-eighth aspect~~claim 38~~ is an optical disc as described in the nineteenth aspect~~claim 19~~, wherein only one edge of the track groove is wobbled.

Please replace the paragraph beginning page 17, line 14, with the following rewritten paragraph:

According to the present invention, a meaning~~Meaning~~ other than simply identifying the presence or absence of a modification can be imparted to each groove modification by forming groove modifications of multiple different shapes in a wobble groove. More information can therefore be recorded with fewer groove modifications.

Please replace the paragraph beginning page 23, line 1, with the following rewritten paragraph:

In this embodiment of the invention, a positive mark (1) is formed by a discontinuity of width W_1 in the track direction in the first groove, a negative mark (0) is formed by a discontinuity of a width W_0 in the track direction in a second groove, and a synchronization mark S is formed by a discontinuity of width W_s in the track direction in a third groove. These groove discontinuities have a mirror surface such as found in the lands.

Please replace the paragraph beginning page 27, line 24, with the following rewritten paragraph:

It should be noted that depending on the type of optical disc, the grooves may refer to trenches or to the lands between trenches. Note that data can later be written to the mirror surface header 102.

Please replace the paragraph beginning page 42, line 6, with the following rewritten paragraph:

By thus recording data to the wobble waves using modified wobble waves as described above, it is not necessary to use track space to record the synchronization mark S, positive mark (1), or negative mark (0), and data can be extracted by observing the shape of the modified wobble waves of the track. It is therefore not necessary to insert the synchronization mark S, positive mark (1), or negative mark (0) to the header 102 or other specific location, and they can be recorded at a ~~desirable~~desirably location.